

Annual Report 2005

Evaluation of Apple Cultivars for Hard Cider Production

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Summary

A small variety trial of cider apples conducted at Mount Vernon from 1979–1994 provided preliminary observations on the potential of cider apple production. In recent years, with the encouragement of local hard cider makers, WSU's Northwest Washington Research & Extension Center at Mount Vernon (NWREC) has expanded research on apple varieties specifically chosen for the characteristics needed in producing market quality hard cider.

In 2002 the first cider was pressed at Mount Vernon, under the direction of cider cooperator Drew Zimmerman, including 8 varietal and 4 blended ciders. In November 2003, May 2004, November 2004 and December 2005 a series of Cider School classes, taught by Peter Mitchell, were conducted at NWREC. Mitchell is a professional cider maker and trainer in hard cider production techniques from Worcestershire, England. In his courses the emphasis is on hands-on experience of cider production, laboratory techniques, and post production quality analysis.

Participants from the Pacific Northwest (eastern and western Washington, Oregon, Idaho and B.C., Canada) as well as from states as distant as Indiana, Michigan, Montana, Minnesota and Colorado have attended these courses. In December 2005 a one-day workshop in Cider Sensory Evaluation, also conducted by Peter Mitchell, was held and some 30 participants learned established techniques of objective sensory evaluation to characterize different ciders. This was followed that evening by a five-course Cider Food Pairing dinner in which ciders from area cideries in Washington and Oregon were matched with dishes prepared by the culinary staff of Skagit Valley College in Mount Vernon.

In 2005 the fruit harvest and pressing of cider was again supervised by Drew Zimmerman, drawing on the experience of previous seasons to improve techniques of production and handling. Cultivars planted in 2001-02 produced good crops this year, in some cases enough for varietal pressing, and harvest from these trees will increase in 2006. A row of single-tree specimens, including some early American hard cider varieties, was planted in 2003 for evaluation and possible inclusion in future trials. Some first sample fruit may be seen from these trees in 2006. Evaluation of ciders produced in 2003 and 2004 was conducted by participant panels in 2005. Fermentation of ciders from the 2005 crop is in process and samples for evaluation will be set aside for 2006.

Methods

The cider apple trial plot consists of five single-tree replications of each cultivar to provide for sufficient fruit to make single-varietal cider as well as for blending. All trees are free-standing, with row spacing 18' between rows, 12' between trees. Trees planted in 1994 were grafted on MM 106 rootstock, with additions in 1999. Acquisitions in 2001-02 are grafted on MM 106 and M26 rootstock. Specific cultivars being evaluated are listed below (see **Appendix, Table 1.**) A pretest varietal collection of 40 single trees was planted in 2003 for preliminary evaluation, from which replications can be made and added to the main trial if they show promise. Some new acquisitions were planted out in spring 2005 (see **Appendix, Tables 2 and 3.**) This past year a collection of perry pears was also added (see **Appendix, Table 4.**)

The acquisitions include cultivars that have been selected for cider production in France and England not yet tested here that may be well adapted to our climate conditions. In addition, specimen trees of old American varieties used for farm cider in the 1800s and earlier are included, to rediscover and evaluate their unique cider heritage in this country.

In 2003–04 new trees planted at close spacing were established for a cultural trial of hedgerow pruning for possible mechanized harvest methods. The cultivars selected were Foxwhelp, Muscadet de Dieppe, Yarlinton Mill, Vilberie and Brown Snout. These were grafted on strongly dwarfing rootstocks M27 and M9. Progress of this trial is conditional on the amount of grant funding available.

Data collected includes bloom and harvest dates, productivity (yield), harvest fruit analysis (Brix, titratable acid and tannin), and observations relative to ease of culture such as disease susceptibility, vigor and growth habit.

Results

In 2005 the mature trees produced a full crop of fruit. Sufficient fruit for single varietal cider was not available from all cultivars of the younger trees but juice pressed from the fruit was included in the production of some blended ciders. Juice from dessert apple cultivars with characteristics suitable to hard cider fermentation was also used in blending of some ciders.

Fruit from the cider test plot was harvested, placed in storage, and then pressed for juice. Detailed notes were kept on the characteristics of the juice, the blends produced, and the fermentation methods used.

Table 1. Ciders pressed at Mount Vernon in 2005(* indicates dessert apple cultivar).

Cultivar(s)	press date	net fruit	yield	lbs/gal
		(lbs)	(gal)	
Muscadet de Dieppe	Sep 29	199.1	10.0	19.9
Gravenstein*	Sep 29	120.2	8.0	15.0
MacIntosh*	Sep 29	183.7	13.3	13.8
Chisel Jersey	Sep 29	156.9	9.2	17.1
Cap of Liberty	Sep 29	200.9	13.5	14.9
Kingston Black	Sep 29	179.2	21.0	14.9
1-Kermarrien	Oct 18	20.9		
2-Finkenwerder Herbstprinz	Oct 18	20.4		
3-Golden Russet	Oct 18	35.5		
Combined blend 1,2,3		76.8	4.0	19.2
Brown Snout	Oct 18	338.9	21.0	16.1
Harry Masters' Jersey	Oct 18	145.7	10.0	14.6
Dabinett	Oct 18	142.3	10.5	13.6
Vilberie	Oct 18	220.0	17.0	12.9

Table 2. Juice characteristics for ciders bottled at Mount Vernon in 2005

Cultivar(s)	brix	specific gravity	pH	T. Acid % malic	tannin %
Kingston Black	13.8	1.060	3.4	0.70	0.12
MacIntosh *	11.3	1.051	3.4	0.60	0.05
Muscadet de Dieppe	15.3	1.066	4.0	0.33	0.27
Chisel Jersey	11.3	1.050	3.3	0.76	0.20
Gravenstein*	13.3	1.060	3.5	0.50	0.10
Cap of Liberty	12.2	1.056	3.1	1.14	0.11
Golden Russet	16.0	1.070	3.4	0.64	0.08
Harry Masters' Jersey	13.6	1.059	4.0	0.28	0.16
Dabinett	13.2	1.056	4.3	0.48	0.14
Vilberie	12.0	1.052	3.9	0.27	0.33
Kermarrien	13.0	1.056	3.8	0.29	0.26
Brown Snout	14.8	1.065	3.8	0.43	0.16
Finkenwerder Herbstprinz	13.0	1.057	3.4	0.59	0.11

Table 3. Ciders bottled at Mount Vernon in 2005

Batch #	Cultivar(s)	Notes
1	Cap of Liberty	
2	Muscadet de Dieppe + Cap of Liberty	Proportion 1:1
3	Muscadet de Dieppe + McIntosh	Proportion 40:60
4	Brown Snout	Added 1.0 g/liter malic
5	Brown Snout + McIntosh	Proportion 1:1
6	Harry Masters' Jersey + McIntosh	Proportion 1:1
7	Harry Masters' Jersey	Added 2.0 g/liter malic
8	Kingston Black	
9	Brown Snout + Kingston Black	Proportion 1:1
10	Brown Snout + Dabinett	Proportion 1:1
11	Muscadet de Dieppe + Gravenstein	Proportion 40:60
12	Orchard Blend	For events
13	Gravenstein	
14	Brown Snout + Cap of Liberty	Proportion 1:1
15	Kingston Black + Muscadet de Dieppe	Proportion 60:40
16	Chisel Jersey	
17	Kermerrien + Finkenwerder Herbstprinz + Golden Russet	Proportion approx. 1:1:2 by fruit weight
18	Dabinett + Cap of Liberty + Kingston Black + McIntosh	Extra, in glass gallons
19	Brown Snout	Extra, in glass gallons
20	Harry Masters' Jersey	Extra, in glass gallons

Discussion and Recommendations

Results at this point would suggest several cultivars have shown themselves to be promising in terms of productivity and/or cider making quality. All varieties can be enhanced by careful blending, including blends of cider cultivars with existing dessert cultivars such as Jonagold, McIntosh and others. Russet types such as Golden Russet, Ashmead's Kernel, Roxbury Russet and Rubinette can contribute unique complex flavors to blended ciders. Certain varieties can also be used in single-varietal ciders without blending. The varieties Vilberie and Dabinett make single-varietal ciders that have strong bitter components, and the resulting ciders are quite bitter and astringent in character. Blending varieties include those which are best used in combination to produce a complex high quality cider. Recommended best uses for different varieties are shown in Table 4, below.

Table 4. Cider categories by variety

Good Stand Alone	Single-Varietal Stout	Good Varieties for Blending
Single-Varietal		
Brown Snout	Vilberie (very bitter)	Vilberie (adds stout-type character)
Harry Masters' Jersey	Dabinett (bitter)	Dabinett
Muscadet de Dieppe		Chisel Jersey
Kingston Black		WSU AxP Crab (very good blender)
Yarlington Mill		Michelin
Michelin		Foxwhelp
Jonagold (back sweetened)		Ashmead's Kernel
		McIntosh (adds aroma)
		Jonagold
		Tsugaru Homei
		NY 486
		Russets (Golden, Roxbury etc.)

Both blends and single-varietals should be balanced in pH for good quality. Successful production of high quality cider depends a lot on finding a good basic protocol and following good technique, along with individual and innovative variations that greatly enhance the finished product. Participation in a cider making workshop, such as those taught by Peter Mitchell described above, can be of invaluable help in obtaining a basic understanding of production methods and techniques.

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APPENDIX

Table 1. Cider apple cultivar trial

<i>Bittersweet:</i>	Yarlington Mill
Brown Snout	Bulmer's Norman
Chisel Jersey	Medaille D'Or
Dabinette	
Harry Masters' Jersey	
Muscadet de Dieppe	
Michelin	
Vilberie	

Redstreak	
Reine des Hatives	
Reine des Pommes	
Tremlett's Bitter	<i>Bittersharp:</i>
Brown's Apple	
Foxwhelp	
Kingston Black	
Breakwell's Seedling	
<i>Bitter:</i>	
Frequin Rouge	<i>Sharp:</i>
Bramley's Seedling	
Tom Putt	

Sweet:

Taylor's

Other:

Golden Russet

Table 2. New acquisitions 2003 (single trees)

Amere de Berthcourt	Frequin Tardif	Porter's Perfection
American Forestier	Granniwinkle	Red Jersey
Blanc Mollet	Grindstone	Royal Jersey
Brown Thorn	Harrison	Roxbury Russet
Bouteville	Harrison SS	Smith's Cider
Campfield	Harrison #2	Soulard Crab
Cap O'Liberty	Jouveaux	Sweet Alford
Cimitiere	Lambrook Pippin	Sweet Coppin
Coat Jersey	Major	Taliaferro (Colaw)
Court Pendu Plat	Metais	Taylor's
Court Pendu Rose	Muscadet de Dieppe	Whidbey
Crow Egg	Muscat de Bernay	Zabergau Reinette
Ellis Bitter	Nehoe	
Frequin Audievre	Peau de Vache	

Table 3. New acquisitions 2004 (planted spring 2005)

Bedan de Parts	Grimes Golden	Ross Nonpareil
Bramtot	Maude	Stembridge Jersey
Claygate Pearmain	Nelson County Crab	Stoke Red
Doux Normandie	Pethyre	Vagner Ascher
Fillbarrel		

Table 4. Perry pears (single trees, planted fall 2004, source NCGR Corvallis OR)

Barland	Gin	Schweizer Wasserbirne
Barnet	Huffcap, Hendre	Taynton Squash
Blakeney Red	Huffcap, Yellow	Thielersbirne
Butt	Normannischen Ciderbirne	Thorn
Gelbmostler	Romania Perry Pear	Winnals Longdon
